CHAPTER

# 10 Society's Response

## Getting Ready...

- What is an epidemic and how does it affect society?
- How does your lifestyle affect your health?
- How does washing your hands stop the spread of disease?
- Where can you find information on diseases that might affect you in the future?
- What can you do to protect yourself from communicable diseases?

Londoners called 1858 "The Year of the Great Stink."

## Science Log

You and other members of your family have been vaccinated. In addition, if you have pets, they have probably had rabies shots. Make a list of the other ways in which the government helps to keep us healthy. As you learn more about public health programs and services during this chapter, add to your list.

How do you get rid of human waste? For centuries, people dumped it in water. By 1858, the Thames River in London, England was so full of sewage that the city stank. The smell was so strong that people in the House of Parliament could not work. Laws were passed to make sure the Thames River never got so bad again.

Who is responsible for preserving the quality of the water *you* use and drink?

The truth is that everyone has a certain amount of responsibility for keeping water safe to drink. The farmers in the second photograph recognize that. That is why they are building a fence to keep cattle out of a stream.

In the past, many people died from diseases because they did not understand how diseases spread. In this chapter you will explore what people have learned about the spread of disease.

In the third photograph, researchers test water for possible contamination. In this chapter you will learn about other health programs and assess how important such programs are in building healthy communities.

# to Disease

## What You Will Learn

In this chapter you will learn:

- about widespread diseases and how they affect society
- about the importance of health programs and good personal hygiene
- how public health guidelines help maintain the health of a community
- how individuals help maintain personal and public health

## Why It Is Important

- There are many public health services that can assist you in keeping healthy. But unless you know about them, understand their importance, and actually use them, they will not benefit you. Most of these programs are free — why not use them?

## Skills You Will Use

In this chapter you will:

- list the effects of widespread diseases
- analyze the impact of contaminated water
- assess the need for public health guidelines
- assess the role of individuals in maintaining personal and public health
- design a public education campaign

## Starting Point ACTIVITY

### Responding to an Outbreak of Flu

Most people get the flu at some point. They suffer aching muscles, fever, chills, and congestion. Usually, these symptoms pass after a couple of days. But flu can be deadly. During 1918, over one billion people — half the world's total population — got the same flu. Many of them died.

Imagine you are an official responsible for your community's health. Use what you know about how diseases spread to design a poster showing ways people can protect themselves from the flu.

#### What You Need

chart paper  poster board

coloured markers

#### What to Do

1. In a group of two or three, brainstorm the content of your poster. To help you, make a chart with two columns.
   - In the first column, list factors that may contribute to the spread of flu.
   - In the second column, list how you might prevent the spread of flu.
2. Use the materials provided to create a poster that shows people how to protect themselves from the flu. Use colour and visuals to attract attention to your poster.

#### What Did You Discover?

1. As a class, summarize the information your class featured in its posters.
   - **(a)** What factors contribute to the spread of flu?
   - **(b)** What actions help control the spread of flu?

# 10.1 How Diseases Affect Society

**Figure 10.1** Three members of this family died within a month. Both historians and scientists read tombstones to learn about past diseases. But many members of one family dying from an epidemic do not tell the entire story. Consider how such deaths affect the community. For example, in farming communities, many deaths might result in fewer workers, more orphans, and food shortages.

European explorers brought many things to the New World — horses, iron pots, rifles, new seeds. Perhaps what affected Aboriginal groups the most were the diseases they brought — including smallpox, tuberculosis, flu.

Aboriginal groups were not able to fight the diseases because they had never before been exposed to certain illnesses. As a result, millions died.

## Effect on Aboriginal Groups

The result of so many deaths was tragic.

- With fewer hunters, more people starved.
- Many young women died. The birth rate in Aboriginal communities slowed.
- Many elders died before passing on the knowledge of important traditions. The knowledge of some customs was lost.

## Pandemic Disease

Today, diseases such as AIDS are affecting African society in a similar way. Despite modern knowledge of sanitation and personal hygiene, we are not able to prevent the spread of communicable diseases like AIDS because people continue doing things that increase their risk of getting such diseases.

Scientists have a special word for diseases, such as AIDS, that are extremely difficult to control. They refer to them as **pandemics**. Pandemic diseases affect a large proportion of the population over a large geographic area.

**READING Check**

How is a pandemic disease different from others? Give one example of a pandemic disease.

**Did You Know?**

Biological warfare is not a twentieth century invention. In the 1700s, a British general used disease as a weapon against Aboriginal groups. He distributed blankets from people who had died of smallpox. Aboriginals who used the blankets quickly contracted the disease and died, as did many others.

**Try This!**

Name one communicable disease you have had. Check Table 9.1 on page 163. How do you think you got the disease? Did you spread it to anyone else? If so, how? Explain how the disease affected your social life.

# AIDS and the Law

## Think About It

AIDS is a communicable disease that is spreading around the world. Some people infected with the AIDS virus are knowingly spreading it to others. Should these people be charged with a criminal offence? Use the following guide to help you develop and state an opinion.

### What to Do

1. Use library and Internet sources to gather information about how AIDS is spread.

2. **(a)** Read and think about the articles that discuss whether or not people with AIDS should be charged with a criminal offence if they spread the virus.

   **(b)** Discuss the ideas with your friends and family to get further input.

3. Make a decision about how you feel.
   - Do you think people should not be charged under any circumstances? Then say so and explain why. Remember to provide supporting points for your argument.
   - Do you think some people should be charged but not others? Explain who should be charged, and why. Explain who should not be charged, and why.

4. Work with a partner to practise speaking your point of view orally.

5. Express your point of view, with supporting points, in an oral presentation to a small group.

6. Listen to other people's ideas.

## Analyze

1. Think about the ideas expressed in your class.

   **(a)** List three points you might support. For each one, provide a reason for your support.

   **(b)** List three points you reject. For each one, provide a reason for your lack of support.

2. Should people with AIDS be responsible for telling the people around them? Consider both sides by suggesting an argument for and against that each of the following people might make.
   - employer
   - teacher
   - sexual partner
   - member of the community
   - life insurance representative

**Computer CONNECT**

Use a word processor to organize your arguments for and against.

**Internet CONNECT**

www.mcgrawhill.ca/links/science.connect2

To learn more about how AIDS is spread and the issue of whether people who spread the virus should be charged, go to the above web site. Then go to Internet Connects, Unit C, Chapter 10, and then to How AIDS Is Spread.

## Off the Wall

Figure 10.3

Doctors who treated people with the plague dressed carefully to try to avoid getting the disease. Spices inside the beak of this outfit were intended to purify the air. The wand was used to take each patient's pulse.

During the 1500s, doctors did not know that bacteria spread the plague. Identify some ways in which doctors might have been infected with the plague.

## Pandemic and Epidemic Diseases

Pandemic diseases affect a large proportion of the people over a large geographic area and are difficult to control. Contagious diseases that are not so widespread are called **epidemics**. This word is used when many people in a local area suffer from a disease at the same time.

Study the time line below to learn about outbreaks of various pandemic and epidemic diseases. Note how each of the outbreaks affected society. Also note the social conditions that contributed to the spread of each disease.

Figure 10.2

| | 1346–1350 Bubonic Plague Pandemic | 1500s to 1700s Tuberculosis Epidemic |
|---|---|---|
| | The bubonic plague is a dangerous bacterial disease with symptoms of fever, chills, and swollen glands. From 1346 to 1350, it spread through Asia and Europe.<br><br>After the 1300s, the bubonic plague was not as widespread for several centuries. There were two more pandemics — one in 1542, the other in 1900. The last reported cases of bubonic plague were in San Francisco during World War I. | Tuberculosis is a bacterial disease that damages the lungs. It was common in Europe and was spread around the world by European sailors and explorers.<br><br>In Canada, tuberculosis is responsible for a lot of illness and many deaths among Aboriginal peoples. Problems were particularly bad in the North. During the 1950s and 1960s, more than 70 percent of the Inuit in Keewatin were infected with the tuberculosis bacteria. |
| **Social Conditions** | • overcrowded cities<br>• limited clean water<br>• no waste disposal facilities<br>• poor sanitation and hygiene<br>• high population of rats that carried the disease | • Aboriginal population had no previous exposure to the disease<br>• overcrowding in boarding schools<br>• poor air circulation<br>• lack of sanitation<br>• poor diets |
| **Impact** | • 30 to 50 percent of the population died<br>• over 100 million deaths worldwide<br>• People with the plague were put into **quarantine**. They were held in a sealed-off area until they died or got better and no longer posed a disease threat to others. Only authorities with special permission could enter the quarantine area.<br>• crime rate dropped | • patients were sent to special treatment facilities called sanatoriums<br>• many children were put up for adoption instead of being returned to their families<br>• some Aboriginal adults lost contact with their communities |

**Disc CONNECT**

To learn more about the bubonic plague and how it is spread, load the student CD-ROM onto your computer. Launch the **Bacteria** applet and follow the instructions.

**DidYouKnow?**

In western Canada in the early 1900s, 25 percent of Aboriginal and Inuit children in residential schools died of tuberculosis. Aboriginal and Inuit people are seven times more likely to get this disease.

## DidYouKnow?

The Spanish flu arrived in Alberta in October 1918, with 15 ill soldiers who were returning from World War I. Although the soldiers were isolated at Scarcee Military Camp, the disease spread. The numbers of infected people grew so high that the government banned public gatherings. More than 3000 Albertans died.

If you had been in New York City in 1918, you would have paid a $500 fine for spitting, sneezing, or coughing in public. Such laws were used to try to reduce the spread of the Spanish flu.

## Off the Wall

During the late 1500s in England, "resurrection men" dug up corpses from recent burials and sold them for approximately $15 to doctors who wanted to learn more about human anatomy. Fifteen dollars might not seem like a lot of money today, but at the time it was more than many people earned in a month.

| | 1918<br>Spanish Flu Pandemic | 1980s to present<br>AIDS Pandemic |
|---|---|---|
| | The Spanish flu is a viral disease that spread around the world during 1918. It killed thousands of people on every continent except Antarctica. | AIDS is a viral disease that weakens the ability of the body to fight diseases. AIDS was officially recognized as a disease in 1980. It is common around the world and increasing in severity. In Canada, there is approximately a 10 percent increase in new infections each year. |
| **Social Conditions** | • soldiers travelling during World War I spread flu to people who had not previously been exposed<br>• poor sanitation<br>• poor diets<br>• little or no access to medical care as health-care professionals were treating sick and injured soldiers | • sexual contact<br>• sharing needles (drugs, tattoos)<br>• infants born from infected mothers<br>• transfusions of infected blood |
| **Impact** | • in Canada, more people died from Spanish flu (50 000) than from the war<br>• 21 million deaths worldwide<br>• loss of income for businesses such as theatres and restaurants because of fear of catching the flu<br>• crime rate dropped | • fourth leading cause of death worldwide<br>• high costs for treatment; no cure<br>• fear and confusion about AIDS results in negative treatment of infected individuals |

## READING Check

List three effects of AIDS on society.

## DidYouKnow?

In some countries of Africa (e.g., Uganda), up to one-third of the people of child-bearing age are infected with HIV. As a result, many children are poorly cared for or are orphaned at a young age. So many people are unable to work that the economy has been adversely affected. The cost of treating AIDS is so high that governments cannot afford to treat victims.

**Figure 10.4** Sanitary public toilets are not available everywhere around the world. Some countries use a cesspit, which is like an open hole. When the cesspit becomes full, urine and feces slop over the sides and could run into the street, spreading any disease pathogens that are present.

## The Beginning of Public Health

Imagine living during the bubonic plague pandemic, when people did not know what caused disease. Imagine how frightened you would be.

Figure 10.3 on page 178 shows what some people did to protect themselves from the plague.

At first, nothing was done to kill the rats that originally spread the disease. In addition, people dumped human waste in the streets. After some people began to understand that there might be a connection between sanitation and disease, city officials ordered streets to be cleaned and quarantined sick people in special facilities.

As people began to see the results of these kinds of measures, they became more interested in working together to develop healthy communities. This is referred to as **public health**.

**READING Check**

Why did society begin to take actions to protect the health of the community?

Gradually, the government got involved in caring for public health. In England, "The Year of the Great Stink" helped speed the development of these laws. People who dumped waste and sewage in the Thames River were fined. Even though the new laws were not very well enforced, they were the beginnings of the public health system we have today.

**Internet CONNECT**

www.mcgrawhill.ca/links/science.connect2

There have been epidemics of smallpox, cholera, typhoid fever, diphtheria, and whooping cough. To learn more about these diseases, go to the above web site. Then go to Internet Connects, Unit C, Chapter 10, and then to Epidemics.

**Key Terms**

pandemics
epidemics
quarantine
public health

## Check Your Understanding

1. When does an epidemic become a pandemic?
2. Make a list of the impact of pandemic diseases on society.
3. List three pandemic diseases. Identify the social conditions that contributed to the spread of each one.
4. With a partner, use the Internet to research one of the following epidemic diseases: smallpox, cholera, typhoid fever, diphtheria, whooping cough. Develop a short oral presentation that mentions:
   - how it spreads
   - details about the disease
   - its impact on society

# 10.2 Improving Human Health

Health programs came to Canada after World War I as a direct result of the 1918 Spanish flu pandemic. Canadians realized they needed to rebuild the population. They also realized that they never wanted to suffer such a pandemic again.

In 1919, the Canadian government established its first department of health. Today, provincial health departments throughout the country do such jobs as:

- monitoring the safety of drinking water,
- checking the pollutants in the air we breathe, and
- taking measures to avoid outbreaks of disease.

In Alberta, the public health service is called the Regional Health Authority. This authority offers many public health programs and services. Study Figures 10.5 to 10.11 and the captions with each figure. As you do, make notes about the programs and services provided by public health organizations and how each improves human health.

**DidYouKnow?**

The Romans were one of the earliest cultures to recognize the need for sanitation and safe water. They built public baths and toilets and constructed waterways called aqueducts to transport fresh water into towns. Wealthy people even had water piped into their homes.

## Water Quality

**Figure 10.5** Water quality specialists test beach water and report any problems to the public. For example, if the bacterial count in a lake reaches dangerous levels, beaches may be closed until the count returns to safe levels.

- Water is tested on a regular basis to ensure it is safe for drinking, cooking, bathing, or swimming.
- Water is treated to make it safe to drink. Treatment plants use chemicals such as chlorine to kill harmful bacteria.

## Removal of Garbage

**Figure 10.6** Most of our garbage ends up in landfill sites like the one shown here.

- Landfill sites prevent waste materials from harming the environment or entering the water system. Before the landfill is used, the ground is sealed to prevent toxic chemicals from accidentally entering the water supply.

### Treatment of Human and Animal Wastes

- In sewage treatment plants, solid wastes are removed by settling or filtering. Helpful bacteria decompose any organic matter. The water is treated chemically to make it safe to drink.
- Large-scale livestock operations produce large quantities of manure that must be treated. Some producers store the manure in large lagoons on their farms. Modern treatment facilities separate solids from liquids, remove excess fertilizers, and recycle clean water for farm use. The liquid manure is then spread on cropland.

### Air Quality

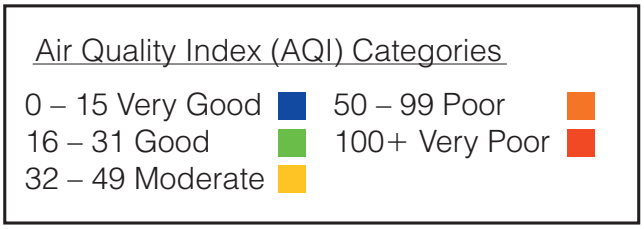



**Figure 10.7** The Air Quality Index provides a reading of air quality and reasons for poor quality for many communities. Smog, which is a mixture of air pollutants, might be one reason for poor quality air. A smog alert warns people who are at risk or suffer from heart or lung problems to take protective action such as choosing to stay indoors.

- Air quality is tested and the results are provided to the public. Health Canada has developed standards and guidelines that list allowable levels of pollutants in the air you breathe. When the levels of pollutants are too high, people are advised to stay indoors and avoid heavy physical exercise. Physical exercise increases the body's need for oxygen, which may be difficult to get when there is poor air quality.

READING Check

Describe four concerns that public health programs have addressed.

### Mass Vaccination

**Figure 10.8** When children are two months old, they begin receiving injections that provide them with protection from various contagious diseases. Most children get injections regularly until they are four to six years old. As they get older, they may receive booster shots to renew their protection. For example, you may have had a booster against tetanus, which is also called lockjaw.

- **Vaccinations** increase people's ability to fight off a disease. In Canada, children are often vaccinated against diphtheria, whooping cough, measles, mumps, tetanus, polio, and rubella. People who travel to other countries may get shots against yellow fever, typhoid fever, or hepatitis. They need to check health information for the destinations they are travelling to in order to adequately protect themselves.
- Public health officials often develop new vaccinations that respond to new outbreaks of disease. For example, meningitis is an inflammation of the covering of the brain. When this disease starts to spread in an area, public health officials provide free vaccinations against it to children and teens, who are most likely to get the infection. You will learn more about vaccinations in Chapter 11.

### Food Safety

**Figure 10.9** Education campaigns such as *Fight*BAC!™ reduce the number of illnesses spread by poor food handling. The campaign promotes four points:

- Clean — wash hands and surfaces often
- Cook — cook to proper temperature
- Separate — do not cross-contaminate (for example, keep separate cutting boards for meats and vegetables)
- Chill — refrigerate promptly

- Health authorities use newspapers, radio, pamphlets, brochures, and the Internet to promote food safety awareness. Food inspectors check that workers in restaurants, food companies, and meat packing plants handle food safely.

### The Choice Is Yours

These are just some of the programs developed to decrease the spread of disease and protect human health. The fact that you are studying this in school suggests that public health authorities consider educating people about health to be very important.

The next link in the chain is you. Are you concerned enough about your health to learn the many ways you can stay healthy? Do you care enough to maintain high standards of personal hygiene? When you get sick, are you willing to make sure that you do not spread the disease to others? Do you take time to learn how to protect your own and others' health and safety by taking training in first aid, swimming, lifesaving, or babysitter's training?

Now that you understand better how to prevent disease, it is up to you!

READING Check

Name four training programs that teens can take to protect community health.

## Check Your Understanding

**Key Terms**

vaccinations

1. In your own words, explain the role of public health in Canada.
2. Why is chlorine used to treat swimming pools and drinking water?
3. **(a)** How do high standards of personal hygiene affect individuals?

   **(b)** How do such standards affect the community?
4. Describe three local public health programs. How does each one protect community health?
5. Consider what you are willing to do to contribute to public health. Write a paragraph or prepare a one-minute explanation of what you are willing to do.

# 10.3 Public Health and You

Vaccinations have reduced the number of people who die from communicable diseases. For example, smallpox has killed millions of people around the world. Today, the smallpox virus exists only in laboratories. Vaccination against smallpox is no longer recommended.

Does this mean that communicable diseases are no longer a serious problem? Should you just ignore public health guidelines?

The answer is no. There are many reasons for keeping an eye on public health guidelines.

READING Check

Give three reasons why public health guidelines are necessary.

## Protecting Health

Diseases are not going away. In fact, many old diseases that were thought to have disappeared are resurfacing. These include polio and drug-resistant variations of tuberculosis. New diseases, such as AIDS and SARS, are also emerging. Public health guidelines help to protect you from these and other diseases. Table 10.1 explains how.

**Table 10.1** Factors and Public Health Guidelines

| Factor | Concern | Public Health Guidelines |
|---|---|---|
| population growth and overcrowding | • overcrowded conditions increase the chances of being exposed to pathogens | • Good personal hygiene reduces the spread of pathogens.<br>• Treating and disposing of wastes also reduces their spread. |
| migration | • diseases may be carried from country to country or from rural communities to cities | • Disease monitoring keeps an eye on the level of disease.<br>• When levels are high, emergency response plans may prevent migration.<br>• Travellers and their belongings are disinfected to prevent the spread of pathogens. |
| lifestyle | • people eat out | • Restaurant inspections ensure food-handling practices are safe and eating areas and utensils are kept sanitary. |
| travel | • increased exposure to disease (for example, eating improperly prepared foods, using unsanitary public washrooms) | • Travellers receive special vaccinations before travelling to some countries.<br>• Travellers receive brochures explaining how to protect themselves from pathogens in food and water. |
| food supply | • food comes from many countries<br>• food may harbour pathogens | • Food inspectors test foods for pathogens. |
| sexual activity and childbirth | • sexual contact results in spread of sexually transmitted diseases (STDs)<br>underweight babies,<br>• unhealthy mothers | • STD awareness programs provide the facts.<br>• Prenatal nutrition programs teach mothers proper nutrition.<br>• Awareness education programs for fetal alcohol spectrum disorder reduce the number of mothers who drink during pregnancy.<br>number of mothers who drink during pregnancy. |

## Health Warnings

How do you know when there is a major health concern? Health authorities release warnings or advisories to alert you. These include:

- food recalls — In a food recall, all products containing a contaminated ingredient must be removed from store shelves. Radio and television news programs name the product, explain the danger, and tell the public what to do.
- boil-water advisories — When tests show drinking water is unsafe, health authorities warn members of the public to boil all water used for personal purposes such as drinking, cooking, and brushing teeth.
- mass vaccinations — When a communicable disease is beginning to spread, health officials provide free vaccinations for people likely to get the disease.
- road safety — In order to protect people who ride bicycles or drive vehicles, public health authorities provide information about the proper use of helmets, seatbelts, and other safety equipment. Alberta also has laws enforcing the use of child safety seats and bike helmets.

**Figure 10.10** The concern about infectious diseases is worldwide. This Chinese poster tells people how to reduce the spread of scarlet fever. It says:
- Go to hospital as early as possible when infected.
- See a doctor as soon as you have a sore throat.
- Take the vaccination.

**READING Check**

Describe two situations when health authorities might issue a warning.

**Figure 10.11** Public health officials encouraged legislators to pass a law requiring all cyclists under 18 to wear helmets when they are biking. Falling off a bicycle — even onto a soft surface when you are biking at a low speed — can cause brain damage.

**Figure 10.12** Public health guidelines explain how to correctly install and adjust child car seats. The correct use of child safety seats protects infants and young children from injury. Unit D discusses how seat belts work.

**DidYouKnow?**

Preventable injury is the leading cause of death and disability among Canadian teens and children. Over 2000 young Canadians die every year because of injuries, and over 85 000 are hospitalized. In Unit D, you will see that vehicle collisions are the most frequent cause of fatal injuries.

INVESTIGATION 10–B

SKILL CHECK
- Initiating and Planning
- Performing and Recording
- Analyzing and Interpreting
- Communication and Teamwork

# Who Is Watching the Water?

## Think About It

In Canada, the provincial governments have regulations that protect the quality of drinking water. Unfortunately, these regulations are sometimes disregarded.

What happens when water is not properly tested and treated? What role does public health play?

Use the information below to find out about water contamination that killed people in a small Ontario town of 5000 people during May 2000.

### WALKERTON'S WATER TRAGEDY

**May 12, 2000** — It rains so heavily that bacteria wash into a shallow town well.

**May 15, 2000** — The town's public utilities commission (PUC) take some water samples.

**May 17, 2000** — Local doctors begin treating residents who are complaining of bloody diarrhea, vomiting, cramps, and fever.

**May 18, 2000** — Test results from the May 15 samples show that the water is contaminated with bacteria. The PUC manager does not notify the public or the public health centre of any concern.

**May 19, 2000** — The public health centre is first notified about several patients with bloody diarrhea. The PUC assures public health officials that the water is safe.

**May 21, 2000** — Thousands of residents are sick and have similar symptoms. The public health centre begins to test the water and orders a boil-water advisory.

**May 22, 2000** — One person dies. Test results from the public health centre show that the water supply is contaminated with deadly bacteria (*E. coli 0157:H7*). *E. coli* bacteria are naturally present in humans. There is a harmful strain that grows in cattle that causes serious illness in humans if cattle feces get into the human water supply.

**End of May, 2000** — Seven people are dead. An investigation begins.

**Summer 2000** — Water is treated and certified safe to drink.

**Present** — Some people are still suffering from symptoms. Many people do not trust the water and drink bottled water only.

### What to Do

1. In a team of three, discuss what happened in Walkerton using the questions that follow as a guide.
   - How was Walkerton's water supply contaminated?
   - How did this contamination affect human health?
   - How was the water supply monitored to identify contaminants?
   - Who was responsible for monitoring the water quality?
   - Why did the water monitoring system fail in Walkerton?
   - How did the public health centre identify the problem and protect residents?
2. Prepare answers to each question.
3. You want to present this information to the community. Decide what method you will use — a public meeting, debate, newspaper article, or multimedia presentation. Prepare your presentation.
4. Role-play your presentation to the rest of the class.

## Analyze

1. With a partner, evaluate how well the information presented by each group meets the following criteria:
   - relevant
   - reliable
   - adequate
2. "Human error was the main reason for the loss of human life in Walkerton." Agree or disagree with the statement. Express your point of view, with supporting reasons, in a brief oral presentation.
3. As a class, decide how your community might prepare itself to prevent the events that took place in Walkerton.

## From the Womb to the Grave

Public health guidelines help prevent disease and promote wellness. Study the visuals below and read the captions to see how public health programs can improve the quality of life during each stage of an individual's development.

READING Check

What are two ways in which public health services help prevent disease?

**Figure 10.13** The Canada Prenatal Nutrition Program educates pregnant women about lifestyle issues. This program works with women who have risk factors that may threaten their health and the development of their baby. For example, they work with young mothers to encourage them to eat foods that will help the baby develop properly. Similarly, they advise pregnant women that the use of alcohol, tobacco, or drugs negatively affects the development of a baby.

**Figure 10.14** Children are vaccinated against common diseases before starting school. These vaccinations reduce the spread of communicable diseases. Vaccinations are provided for other high-risk groups too. For example, seniors, health-care workers, and teachers may get flu shots to protect them during the flu season.

**DidYouKnow?**

Spending money coaching women who have risk factors that may threaten their baby has positive results. Babies who are born healthy save the public health system $600 000 each in hospital and medical-care costs over the course of their life.

**Figure 10.15** Public health nurses work with teachers to promote health. For example, tobacco is an important public health issue. Using ads such as this one developed by Health Canada helps take the glamour out of smoking. Learning about health risks allows you to make informed choices.

**DidYouKnow?**

On average, someone born in Canada today can expect to live 67 years free of ailments that limit their physical activity. People who follow guidelines for health extend their active years.

**Figure 10.16** Health guidelines promote staying active and fit to live long and live well. Practising Taoist Tai Chi is one way that you can keep fit mentally and physically.

SKILL CHECK
- Initiating and Planning
- Performing and Recording
- Analyzing and Interpreting
- Communication and Teamwork

# How Well Do You Wash Your Hands?

Since you were very young, people have told you about the importance of washing your hands properly to keep germs from spreading. In this activity, you will use Glo Germ™ oil to show what happens when hands are improperly cleaned. Glo Germ™ oil can be applied to your hands like hand lotion. This spreads thousands of tiny plastic fluorescent "germs" onto your hands. Under an ultraviolet lamp, the plastic "germs" glow.

Glo Germ™ powder can be used to show how germs are spread. Spread a small amount in the palm of your hand and shake hands with several other people. Use an ultraviolet lamp to demonstrate how you have transferred "germs."

## Challenge

Use Glo Germ™ oil and Glo Germ™ powder in a demonstration to convince a group of children that washing hands properly is important.

### Safety Precautions

- Wash your hands thoroughly at the end of the activity.

### Apparatus

ultraviolet lamp

### Materials

Glo Germ™ oil  Glo Germ™ powder

art supplies (may include scissors, glue, tape, markers, paper)

## Design Criteria

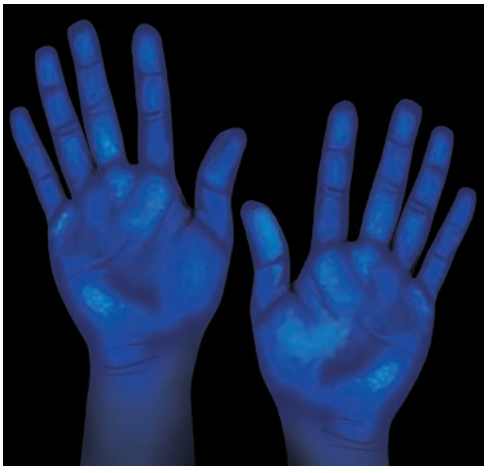
**A.** Design a hand-washing demonstration to use in a primary school class. Your design should address the following points.
- Demonstrate proper technique for washing hands.
- Show the results of improper hand washing.
- Demonstrate how germs are spread.
- Emphasize how clean hands reduce the spread of germs.

**B.** Use only the materials provided.

**C.** Develop:
- a list of apparatus, materials, and safety precautions; and
- a detailed plan of the demonstration.

## Plan and Construct

1. With your group, brainstorm a set of instructions about how to wash hands properly.
2. Practise carrying out the instructions a few times.
3. Use Glo Germ™ oil to test your hand-washing technique.



4. Use Glo Germ™ powder to demonstrate how germs are spread from person to person.
5. Develop a jingle or slogan about clean hands that will appeal to children.
6. Put all of the elements of your presentation together. Rehearse it several times.
7. Use the worksheet provided by your teacher to evaluate what you have done.

**Computer CONNECT**

Design a multimedia presentation or a web site to promote good personal hygiene.

## How Important Are Your Personal Actions?

Proper hand washing is only one aspect of personal health. You have other important choices to make. Consider these.

1. Protect your own health — take care of your personal hygiene; get vaccinations; keep informed about health advisories
2. Make wise lifestyle choices — exercise regularly; eat a well-balanced diet; avoid smoking, alcohol, and non-prescription drugs; avoid sexual contact
3. Adopt safer practices — wash your hands often; wear bike helmets and seat belts; when you become sexually active, practise safe sex

Your choices — wise or otherwise — will affect the people around you.

**Figure 10.17** How does washing your hands protect others from disease?

READING Check

How do personal actions contribute to the health of your community?

**Internet CONNECT**

**www.mcgrawhill.ca/links/science.connect2**

HIV can be spread through tattooing and body piercing. To find out about the risks of catching HIV and to protect yourself from these risks, go to the above web site. Then go to Internet Connects, Unit C, Chapter 10, and then to AIDS and Body Piercing.

**DidYouKnow?**

It takes about 30 seconds to sing "Happy Birthday" twice. Sing the song to yourself the next time you wash your hands. Notice how long proper cleansing takes.

## Check Your Understanding

1. List five factors that account for the spread of communicable disease.
2. Do you think it is important to have public health guidelines? Use examples to help you explain why or why not.
3. Defend the statement, "An ounce of prevention is worth a pound of cure."
4. What are three steps you can take to protect your own health? Provide a specific example of each.

CHAPTER

# 10 Review

## Key Terms

pandemics
epidemics
quarantine
public health
vaccinations

## Reviewing Key Terms

If you need to review, the section numbers show where these terms were introduced.

1. Describe the difference between an epidemic and a pandemic. (10.1)
2. What is public health? (10.2)
3. Define "vaccination" and list two diseases that people get vaccinated against. (10.2)
4. What does it mean to be placed under quarantine? (10.3)

## Understanding Key Ideas

Section numbers are provided if you need to review.

5. Why did interest in public health begin to develop? (10.1)
6. **(a)** Describe the social conditions that caused bubonic plague to spread.

   **(b)** Explain what impact the bubonic plague had on society. (10.1)

7. What is the purpose of public health programs and services? (10.2)
8. Explain how public health attention to water and air quality has improved the health of communities. (10.2)
9. Use three examples to explain why we need public health guidelines. (10.3)

## Developing Skills

10. List several examples of how public health programs in your community protect people from disease. (10.3)
11. How might our lifestyle today cause disease to spread? (10.2, 10.3)
12. Defend the statement, "Human carelessness causes disease to spread." (10.2, 10.3)

## Problem Solving/Applying

13. "Rivers, lakes, and streams belong to everyone. Each one of us needs to assume responsibility for our waterways to protect health." Do you agree or disagree? Write a paragraph in which you outline your opinion and support your reasoning. (10.3)
14. Make a list of personal actions you might take if you were going to work in a country where communicable diseases were common and widespread. (10.2)

## Critical Thinking

**15.** In the United Kingdom in 2001, many farms were placed under quarantine for foot-and-mouth disease, a communicable disease that affects livestock. How did a quarantine help the situation? (10.1)

**16.** Social scientists occasionally come across an Aboriginal group that has never had contact with the modern world and its diseases. Imagine you are a social scientist who plans to visit such a group. Using lessons learned from the history of Aboriginals in North America, what dangers does your visit pose to the health of these people? (10.1)

## Extend Your Understanding

**17.** Interview a school or community health nurse. Find out what public health services exist around your school. (10.3)

**18.** Collect at least two articles about pollution from landfills or industrial waste sites. (10.3)

**(a)** Read each article and identify the main point.

**(b)** What public health actions were taken to protect health?

Present your findings orally.

### Pause & Reflect

**1.** Check the list you made in your Science Log when you were beginning this chapter. After investigating the topics in this chapter, what other public health programs and services can you add to your list?

**2.** Look for at least three success stories about public health in newspapers or magazines. Examples include water quality reports, food safety warnings, and vaccination programs. Read each article and explain how the public health measures affected the community.